What Is Claimed Is:

1. A method for field-oriented regulation of a synchronous machine excited by a permanent magnet, having the following method steps:

- determining of a quadrature-axis current component setpoint value (Iq_setpoint),
- supplying the quadrature-axis current component setpoint value thus determined and rotational speed information to a decoupling network which contains a stationary machine model,
- determining a direct-axis voltage component (ud) and a quadrature-axis voltage component (uq) in the decoupling network as a function of only the quadrature-axis current component setpoint value, the rotational speed information and the stationary machine model and
- converting the direct-axis voltage component (ud) and the quadrature-axis voltage component (uq) into triggering pulses for the synchronous machine.

2. The method as recited in Claim 1, wherein the quadrature-axis current component setpoint value is determined in a logic unit.

3. The method as recited in Claim 1 or 2, wherein a reversing operation is performed in the logic unit as a function of a predetermined rotational speed threshold value.

4. The method as recited in Claim 3, wherein the quadrature-axis current component setpoint value (Iq_setpoint) is derived by a higher-level control unit (14) at rotational speeds which are lower than the predetermined rotational speed threshold value.

5. The method as recited in Claim 4, wherein the quadrature-axis current component setpoint value is derived from a setpoint torque predetermined by the higher-level control unit

(14).

6. The method as recited in Claim 5, wherein the setpoint torque is the starting torque.

7. The method as recited in one of Claims 3 through 6, wherein the quadrature-axis current component setpoint value (Iq_setpoint) is derived by a battery voltage regulator (17) at rotational speeds which are greater than the predetermined rotational speed threshold value.

8. The method as recited in Claim 7, wherein the battery voltage regulator (17) determines the quadrature-axis current component setpoint value as a function of a battery voltage setpoint value supplied by a higher-level energy management system and a battery voltage actual value supplied by a battery voltage sensor.

9. A device for field-oriented regulation of a synchronous machine excited by a permanent magnet, comprising

- a decoupling network (19) which contains a stationary machine model and which has an input for a quadrature-axis current component setpoint value (Iq_setpoint) and an input for rotational speed information and which is provided for determining a direct-axis voltage component (ud) and a quadrature-axis voltage component (uq) as a function of only the quadrature-axis current component setpoint value, the rotational speed information and the stationary machine model, and
- a conversion unit (6, 7, 20, 21, 23) which is connected to the decoupling network (19) for converting the direct-axis voltage component (ud) thus determined and the quadrature-axis voltage component (uq) thus determined into triggering pulses for the synchronous machine.

10. The device as recited in Claim 9, wherein it includes a logic unit (18) which has an output for the quadrature-axis

current component setpoint value (Iq_setpoint).

11. The device as recited in Claim 10, wherein the logic unit (18) has an input for rotational speed information and for performing a reversing operation as a function of a predetermined rotational speed threshold value.

12. The device as recited in Claim 11, wherein the logic unit (18) outputs at its output a quadrature-axis current component setpoint value which is derived by a higher-level control unit (14) at rotational speeds which are lower than the predetermined rotational speed threshold value.

13. The device as recited in Claim 12, wherein the logic unit (18) derives the quadrature-axis current component setpoint value from a setpoint torque which is in turn derived by the higher-level control unit (14).

14. The device as recited in Claim 13, wherein the setpoint torque is the starting torque.

15. The device as recited in one of Claims 11 through 14, wherein the logic unit (18) outputs at its output a quadrature-axis current component setpoint value which is supplied by a battery voltage regulator (17) at rotational speeds which are greater than the predetermined rotational speed threshold value.

16. The device as recited in Claim 15, wherein the battery voltage regulator (17) has a battery voltage setpoint value input which is connected to a higher-level energy management system (15) and has a battery voltage actual value input which is connected to a battery voltage sensor (16).